ONTARIO MINISTRY OF ENVIRONMENT
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SANITARY SURVEY OF THE COMMUNITY OF BALA

District Municipality of Muskoka

1975

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Ontario
Ministry of the Environment

P. G. Cockburn
Director
Central Region

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INTRODUCTION

In January, 1975, a Sanitary Survey of Bala was initiated. The purpose of this work was to determine the adequacy of sewage disposal and treatment in the Community. The goal for the field work was to assess the efficiency of the individual domestic sewage disposal systems in the community and the surrounding Bala Bay cottage area, and to determine the effects of these systems on the Bay.

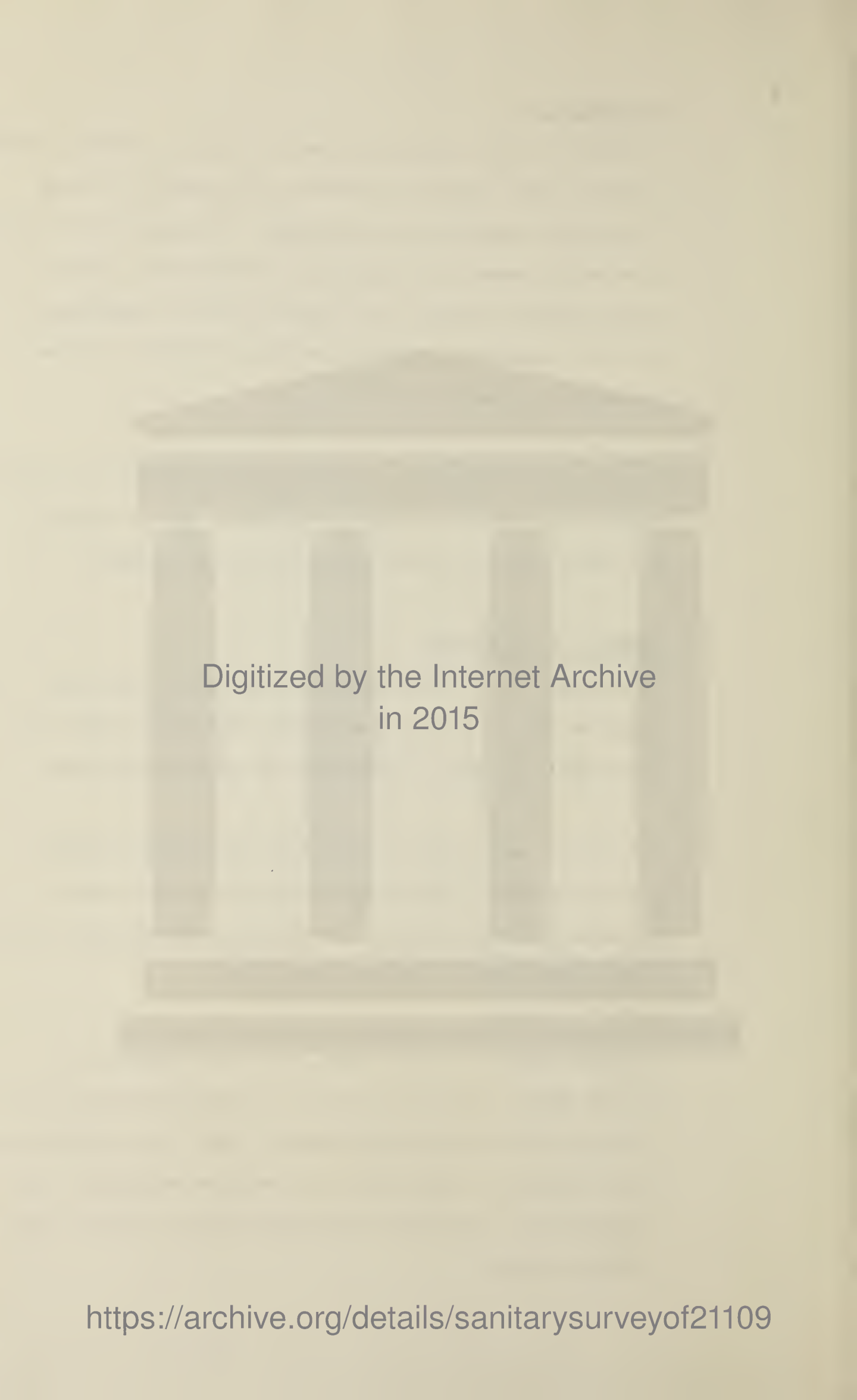
The District Municipality of Muskoka and the Township of Muskoka Lakes were contacted in order to outline to them the intent of the survey and the procedures that were to be followed.

SUMMARY AND CONCLUSIONS

An analysis of the data gathered indicates that a new water pollution control plant project for the Community of Bala is a low priority in terms of protecting the natural environment.

The back lot and cottage surveys found no problem situations that could not be corrected by conventional on-site methods including new septic systems, holding tanks, proprietary aerobic systems and repairs to existing facilities.

The water pollution control plant, although susceptible to run-off and precipitation, provides acceptable treatment of all chemical and bacteriological parameters under normal operations. Run-off conditions cause short term overflows and higher than acceptable total phosphorous and bacteriological levels in the combined effluent.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RECOMMENDATIONS

1. The follow-up and abatement work should continue on the unclassified and problem establishments found in the back lot and Cottage Pollution surveys.

2. Consideration should be given to providing disinfection of the filtrate that bypasses the nutrient removal equipment at the water pollution control plant during run-off conditions and heavy precipitation.

3. The berms around the filter beds at the water pollution control plant should be raised to lessen the amount of run-off passing through.

4. A water main flushing and/or swabbing program should be initiated and carried out regularly.

BACK LOT SURVEY

The greater part of the Community of Bala and the cottages along the north shore of the Moon River are designated as the back lot survey.

This portion of the field work commenced in mid-January, 1975, when district staff prepared the description log. The description log consists of a list of all establishments along with their physical descriptions.

The log is used to identify the establishments during the door to door survey, to maintain control of numbering, and to provide a means of locating individual premises for follow-up abatement.

During the last two weeks of February, the door to door interviews were started. However, snow cover prevented any physical inspection of many of the septic systems and a large number of homes and businesses were closed for the winter.

Field work continued in May when the back lot survey was used as a training program for the summer students in the 1975 Cottage Pollution Control Program. The remainder of the inspections were completed in the Fall of 1975 by district staff when the summer demand work had eased off.

For purposes of uniformity, all the inspections were done following the Cottage Pollution Control Program format which classified establishments as follows:

1. Satisfactory - the system meets the standards of good design, construction and location, is not polluting nor is a public health nuisance.

2. Satisfactory Performance - the system is not up to present day standards but appears in all other aspects a "safe" system and not likely to cause pollution.

3. Seriously Substandard - a defect exists which may cause the system to malfunction in the future. The owner is advised of the defect and is advised that consideration should be given to up-dating the system in the near future.

4. Nuisance (Wash Water) - a system causing wash water to be exposed on the surface of the ground either directly through a waste pipe or escaping from a seepage pit or just thrown on ground surface. Such a condition is known as a Public Health Nuisance. Wash water discharged from any sanitary fixture is contaminated and creates an unhealthy environment. Phosphates and other nutrients from waste discharges encourage weed growth and affect the aesthetic quality of the lake.

5. Nuisance (Toilet and Solid Waste) - a system causing a waste containing faecal or urinary discharges to be exposed on the surface of the ground, either directly through a pipe or escaping from some part of a sewage disposal system including a privy. Also, included in the classification, is "solid waste" or garbage of a kind which can cause a "nuisance", e.g. domestic garbage containing food waste.

6. Direct Polluter - a system which is permitting sewage to contaminate the ground water or to reach the lake either by direct discharge through a pipe or ditch or over the ground surface; or is proven to be polluting by means of water samples or tracer dye tests.

7. Unclassified (temporarily) - a system which has been given a preliminary classification by the student inspector where he feels he cannot use any of the preceeding classifications and has doubts about the system or part of it. These systems require further inspections by the supervisor who will attempt to make a final classification after a thorough investigation.

8. Unclassified - a system (or systems) where it is not possible at the end of the survey to make a classification at that time. Usually they amount to only a few abandoned premises.

A total of 229 establishments were inspected. Of these, 179 were found to have adequately functioning sewage disposal systems. Thirty-five places were classed as having nuisance problems, particularly in the cottage areas. Frequently, the nature of the problem was wash water on the ground surface or a substandard privy. In the residential areas, the problems usually resulted from old septic systems which had become plugged or had broken tiles.

A follow-up and abatement program was started to handle the problem situations. Only four places classed as direct polluters remained so as of January 1, 1976.

Eleven Certificates of Approval for new Class IV systems have been issued as of January 1, 1976. The lot classifications for this portion of the survey are outlined in Appendix I.

BALA BAY AND DARK LAKE SHORELINE SURVEY

To coincide with the "Report on Water Quality in Bala Bay and Dark Lake, 1971", the 1975 Cottage Pollution Control Program encompassed those same bodies of water, although the area of specific interest for this report was Bala Bay. The field work took place in June and July, 1975. A total of 280 establishments were inspected.

One hundred and seventy-one establishments were found to have disposal systems which were operating effectively. Ninety-one places had problems of the nuisance variety; usually substandard privies and wash water disposal. Five places were classed as direct polluters. As with the back lot survey, abatement work was started immediately. As of January 1, 1976, there were 19 outstanding agreements with owners while 27 corrections had been made.

The lot classifications for this portion of the survey are outlined in Appendix I.

BALA WATER POLLUTION CONTROL PLANT (See Appendix V)

The communal sewage treatment plant for Bala consists of a 28,000 gallon, two compartment septic tank, four underdrained filter beds, phosphorous removal, and effluent discharge to Long Lake.

The sewage flow receives primary settling in the septic tanks. The septic tank effluent flows by gravity to the underdrained filter beds. The filter beds are used in pairs and are alternated regularly.

The underdrains collect the filtrate and convey it, again by gravity, to the overflow chamber. This chamber was used to provide chlorine contact time in the plant set up before phosphorous removal. The overflow chamber acts as a wet well and is equipped with a submersible pump.

The pump sends the filtrate to the phosphorous removal unit. Flows in excess of 14 gpm spill over the wall in the chamber and go into the old outfall.

Phosphorous removal is achieved by lime addition. The unit is a package plant capable of treating 20,000 gpd and is housed in its own building. The building also provides storage for the bagged lime.

The powdered lime is mixed with water to make a slurry which is added to the filtrate. The filtrate and lime are rapid mixed; the precipitate then settles out in the tube settlers.

A total of 26 establishments are connected to sanitary sewers. The sewage flow is not metered; however, an estimate of weekday dry weather flow would be 6-8,000 Imperial gallons. A past inspection report has indicated a maximum day flow of approximately 17,000 Imperial gallons per day.

According to the Ministry of the Environment Certificate of Approval (#3-1157-73-006), the pump in the overflow chamber is rated at 14 Igpm. It is noted that during spring run-off conditions and after prolonged rainfall, filtrate spills over the wall in the overflow chamber. Under normal flow conditions, all effluent passes through the phosphorous removal unit. Since the overflow does not receive any further treatment, it is recommended that some provision be made to disinfect this flow when it occurs. A chlorinator controlled by a float switch would be a possible solution.

To help lessen the amount of run-off in the system, the berms around the filter beds should be raised.

Appendix II shows the available sample results of the filtrate and treated effluent for 1975. These results indicate that the phosphorous removal equipment effectively treats the filtrate passing through it.

BALA WATER TREATMENT PLANT

The Community of Bala uses Bala Bay as its water supply. Water flows by gravity from the Bay into a wet well. The intake pipe is eight inch cast iron and extends 150 feet out from shore.

Two duty pumps draw from the wet well to feed the distribution system. One pump is rated at 145 Ipgm, the other at 180 Ipgm. A standby pump, powered by a diesel motor, provides 600 Igpm during emergency situations.

The water is metered and chlorinated before leaving the pump house. Due to the age of the distribution system, the sizes and lengths of water mains are not known. The feeder main is six inch diameter cast iron and is approximately one mile long. There are some mains which are four inch cast iron and others that are made of 1½ inch and 1 inch diameter plastic. The plastic mains are used to serve the cottage areas.

During the Spring, two fire hydrants were flushed to help move chlorine through the system. The product of the flushing made it evident that a main-flushing program should be started and continued on a regular basis.

WATER QUALITY SURVEY OF BALA BAY

In conjunction with the door to door surveys, a water quality survey was conducted on Bala Bay. The 1975 survey follows and up-dates the "Report on Water Quality in Bala Bay and Dark Lake, 1971".

The field work was carried out by Technical Support Section staff. The information from the interim report is presented in Appendix III.

APPENDIX I

ESTABLISHMENT CLASSIFICATIONS

	Classification	No.Establishments	Agreements	Corrections
1. Back Lots	1	37	10	19
	2	73		
	3	53		
	4	11		
	5	24		
	6	4		
	7	24		
	8	3		
Sub Totals		229	10	19
2. Shoreline	1	46	19	27
	2	53		
	3	72		
	4	41		
	5	50		
	6	5		
	7	9		
	8	4		
Sub Totals		280	19	27
Total To Jan. 1/76		509	29	46

APPENDIX II

CHEMICAL ANALYSIS RESULTS* OF 1975 WATER POLLUTION CONTROL PLANT SAMPLES

Date	BOD		Suspended Solids		Total Phosphorous	
1975	Filtrate	Final	Filtrate	Final	Filtrate	Final
April	-	0.2	-	15	-	0.28
May	2	3	10	5	1.6	1.4 Combined Effluent
July	-	10	-	20	-	4.8
Sept.	-	2.8	-	-	-	0.48
Oct.	9	3	100	15	1.5	0.16

* Analysis Results - All sample results are measured in mg/l.

APPENDIX III

1975 WATER QUALITY SURVEY OF BALA BAY AND DARK LAKE

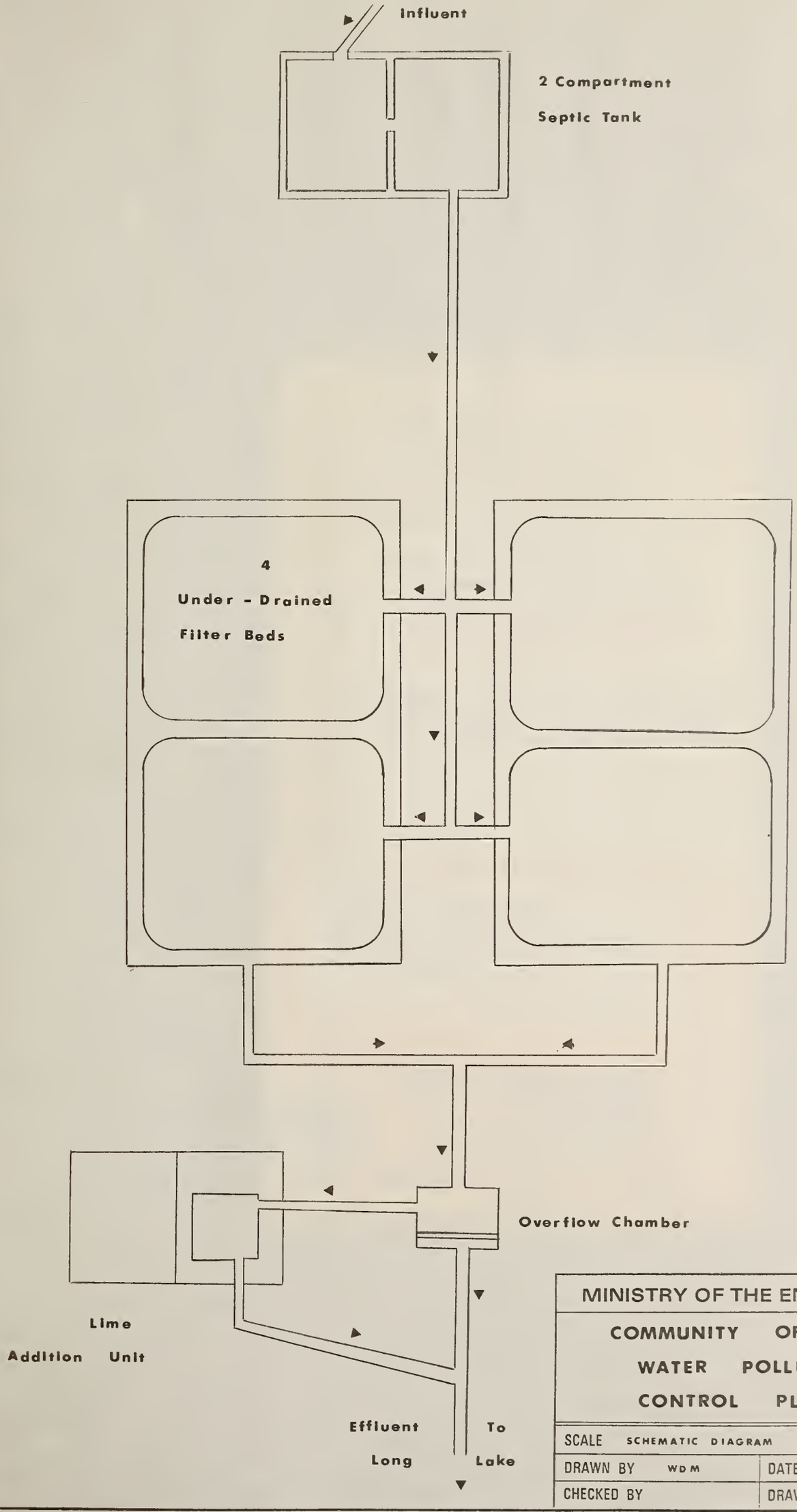
The 1975 Water Qaulity Survey was conducted by the Technical Support Section of the Central Region. It follows the outline of the 1971 report and brings the water quality information up-to-date.

"A comparison of water quality data collected this summer, to that from the 1971 survey of Bala Bay and Dark Lake failed to reveal any measurable deterioration of water quality."

A complete report of this survey will be released later for inclusion in the 1975 Cottage Pollution Survey Report on Bala Bay. The following is a comparison of three parameters from both the 1971 and 1975 work:

	Bottom Water (O_2) Mg/l	Secchi Disc m	(chl a) ug/l
Bala Bay 1971	6.5 (Oct. 13)	4.2	1.7
1975	7.5 (Sept. 24)	6.2	1.6
Dark Lake 1971	0	4.5	2.9
1975	0	5.5	3.1

The 1975 Bala Bay data appears to indicate an improvement of water quality over 1971; however, the author of the report suspects this change to be "natural variation" rather than an actual improvement.



MINISTRY OF THE ENVIRONMENT	
COMMUNITY OF BALA WATER POLLUTION CONTROL PLANT	
SCALE SCHEMATIC DIAGRAM	
DRAWN BY WDM	DATE MARCH. 1976
CHECKED BY	DRAWING NO. APPENDIX V

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